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ABSTRACT

In order to prevent cigarette smoking in young adolescents, the factors which cause it need to be better understood. A study was conducted to investigate the contribution of three psychosocial factors, suggested by previous theory and research, on smoking in a longitudinal sample of seventh graders (N=3,940) who were studied again in the eighth grade. The three psychosocial variables investigated were: (1) beliefs in positive social consequences of smoking; (2) normative smoking prevalence estimates; and (3) risk taking and rebellious tendencies. A model was developed conceptualizing the psychosocial variables leading to smoking and evaluated using LISREL, a computerized program for analyzing covariance structures using maximum likelihood estimates. Beliefs in positive social consequences and high normative expectations were found to have significant effect on smoking in seventh graders. Surprisingly, the effect for risk taking and rebellious tendencies was not found to be significant. Seventh grade smoking behavior was the only factor found to have a significant influence on eighth grade smoking. These findings suggest implications for intervention. (Six tables of data are included.) (ABB)

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Prospective Use of Psychosocial Factors to Predict Cigarette Smoking in Adolescents

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Abstract

The present study investigates the contribution of three psychosocial factors, suggested by previous theory and research, on smoking in a longitudinal sample of seventh and eigth graders. The three psychosocial variables under investigation are (1) beliefs in positive social consequences of smoking, (2) normative smoking prevalance estimates and (3) risk taking and rebellious tendencies. A model was developed and evaluated using LISREL. Beliefs in positive social consequences and high normative expectations were found to have a significant effect on smoking in seventh grade. Surprisingly, the effect for risk taking and rebellious tendencies was not found to be significant. Seventh grade smoking behavior was the only factor found to have a significant influence on eigth grade smoking. A possible explanation for these findings and implications for intervention strategies are discussed.

The onset of cigarette smoking in adolescents has become an increasingly greater problem in recent years. Cigarette smoking is a leading cause of cancer, lung and heart disease. It is occurring with increasing frequency in young adolescents (Brown, Cherry, & Forbes, 1978; U.S. Public Health Service, 1979, 1981). Because of its morbidity, the prevention of cigarette smoking is important. However, in order to prevent cigarette smoking, those factors which cause it need to be better understood.

Several models conceptualizing the psychosocial variables leading to smoking behavior have been developed and evaluated (see Flay et al., 1983, for a review). According to the model developed by Ajzen and Fishbein (1970), an important predictor of adolescents' smoking is beliefs regarding the social consequences of smoking. Individuals who believe in positve social consequences in response to their smoking are more likely to smoke. Another important factor, suggested by Jessor and Jessor, (1977) predicting adolescent smoking behavior is the indiviudal's tendencies toward and affinity for engaging in risk taking and rebellious behavior. Smoking is considered to be one such behavior. Chassin et al.'s (1981) False Consensus Effect model suggests that high normative beliefs regarding smoking prevalance will lead to increased smoking. Therefore, it seems desirable to evaluate a model incorporating all of these factors to predict smoking behavior in adolescents.

The best approach to determining which psychosocial variables precede, and therefore may predict, smoking behavior is longitudinal research. The present study undertakes to investigate the role of the three aforementioned psychosocial variables on smoking behavior in

adolescents 12 to 13 years of age using a longitudinal design. The data were collected as part of the evaluation of a media enhanced school based smoking prevention program. Initially, an exploratory factor analysis and some exploratory regression analyses were performed. Based on these results and the findings of previous research, the model shown in Table 1 was developed (see Table 1).

Social Consequences indicates the degree to which the adolescent believes positive social consequences, such as approval, encouragement and positive reinforcement, will result from cigarette smoking. It was hypothesized that the more positive the student believed the social consequences of smoking would be, the higher the probability of smoking.

Risk-taking/ Rebelliousness refers to how rebellious an adolescent feels and to what extent s/he enjoys taking risks. It was hypothesized that increased risk-taking and rebellious tendencies would lead to a higher probability of smoking.

Normative expectations refers to the individual's beliefs regarding the extent to which smoking is going on around them. The higher the individual's expectations regarding how much smoking is occurring, the more likely it should be that that individual will become a smoker.

Methods

Subjects: The subjects were 3940 seventh grade students. Forty-five percent of the students were males. Sixty percent were white, 26 percent were Hispanic, seven percent were Black and seven percent were Asian. The subjects were of heterogeneous socioeconic backgrounds. Of the full

sample, 2014 had no missing data. Two samples of 250 were randomly selected from the 2014 complete cases. This number was selected to maximize the probability of an adequate fit of the model based on a chi squared test of goodness of fit and to optimize estimation of the parameters. Sample 1 was the test sample; Sample 2 was a cross validation sample.

Measurement: The subjects were measured at two different times: the initial assessment was in Dec. 1981/ Jan. 1982. The second testing was during April and May of 1983. At each time of data collection a questionnaire was completed containing items regarding smoking behavior and intentions as well as items regarding attitudes and beliefs about smoking. Saliva samples were collected for thiocyanate analysis to increase the validity of self-reports of smoking behavior (Baumen and Dent, 1982). Based on the exploratory factor analysis, the three questions with the highest loadings on each of the three factors were selected to be included in the model. The cigarette use variables were composed of a composite of five questions regarding cigarette use. The questions were standardized and summed for each case. The same questions were used for both waves 1 and 2. The questions used are listed in Table 2. All questions were measured on scales of at least 1-5 with one end indicating strong agreement, compliance or high frequency and the other indicating strong disagreemnt, non-compliance or low frequency. Correlations between these items and the smoking behavior variables are listed in Table 3.

The psychosocial factors were permitted to correlate in this model

since it was not expected that they would be independent of each other.

Results

The model was tested using LISREL, a computerized program for analyzing covariance structures using maximum likelihood estimates (Joreskog and Sorbom, 1981). Table 4 shows shows the model with the path coefficients. The parameters indicated are standardized. Signiificant paths are indicated by asterisks.

The model fits the data well, with a nonsignificant chi square of 48.26 with 36 degrees of freedom (p=0.083). The expected relationships were found for both social consequences and normative expectations at wave 1. However, no significant relationship between risk taking /rebelliousness and smoking behavior was found. Based on the T-values of the path coefficients of the psychosocial factors on smoking at wave 2, one would have to conclude that these factors no longer influence smoking at wave 2. However, when a new model was run, in which these paths were forced to be zero, this model was found to be significantly different from the original model (see Table 5). Based on this, we cannot conclude that these three factors do not play a contributory role in smoking behavior at wave 2.

Cross validation: The model was cross validated in two ways using the second sample. First, all parameters were forced to those values estimated in the first sample. This resulted in a chi squared of 108.59 with 66 degrees of freedom (p=.001). The second sample simply tested

whether this model fit this sample data, in addition to the first. All parameters estimated in the first sample were estimated based on the second sample and the chi square goodness of fit was examined. This resulted in a chi squared of 57.89 with 36 degrees of freedom (p=0.012). (See Table 6).

The results of the cross validation analyses indicate a less than perfect cross validation. However, the results are not particularly discouraging. While the chi squared is significant regardless of the way the cross validation is performed, the results of the original analysis and the cross validation analysis indicate the two are not really very different. The path coefficients look close, the mean square residuals for both models are quite small, and the adjusted goodness of fit for both is respectably high. It seems likely that the significant chi squared is an artifact of the large sample size, rather than an accurate indicator of the fit of the model. This probably holds for the chi squared of the original model, as well. It is quite remarkable that a model this complex fitted to a sample of 250 resulted in a nonsignificant chi square. It is likely that this chi squared is an underestimate of how well the model actually fits.

Discussion

Many of the hypotheses generated at the onset of the study were confirmed. Basically, the model studied here seems to be a fair one to help us understand the smoking behavior of seventh and eigth graders. The variables under study account for 53% of the variance in smoking behavior at the first assessment and for 38% of the variance in smoking behavior at

the second. Beliefs regarding social consequences of smoking and normative expectations about smoking seem to have a significant influence on smoking behavior in 12 year olds. The more positive one's beliefs regarding cigarette smoking, and the higher one's normative expectations regarding smoking are, the more likely one is to smoke. Surprisingly, risk-taking and rebellious tendencies did not influence smoking behavior at either assessment. This is particularly noteworthy in light of the significant first order correlations between items making up the risk-taking and rebellious tendencies factor and the smoking composites at both waves of data collection (see Table 3). This would seem to indicate that either these tendencies are not important in understanding smoking behavior, or that no new information regarding the individual above and beyond that accquired through an understanding of beliefs about the social consequences for smoking and normative expectations is provided by risk taking and rebelliousness. The implications of a finding such as this are important for prevention efforts, since it should be easier to modify youth's attitudes towards the social consequences of smoking and beliefs about normative prevalance than it is to change their risk taking and rebellious tendencies. Therefore, based on these results, interventions targetted at smoking prevention in seventh graders should utilize strategies aimed at encouraging more negative beliefs about the social consequences of smoking and providing information regarding accurate normative prevalance rates.

The results of the tests of significance for the three psychosocial factors at grade 8 are somewhat difficult to interpret. Removing all three paths from the model results in a model that is significantly different

from the original model, although no path is individually significant. Based on this, it is possible to conclude that at least one, or some conbination, of these factors seems to have some effect on smoking at wave 2. It seems reasonable to conclude that all three, together, cannot be excluded from the model. However, based on the non-significant T-values, it is likely that any direct contribution on the part of these variables to smoking behavior at grade 8 is relatively small and possibly insignificant from an intervention perspective. It seems that all the practical contribution of these three variables to smoking at grade 8 is mediated through their influence on smoking at grade 7. One possible explanation for these findings is that attitudes on these psychosocial factors are unstable and change between grade 7 and grade 8. Therefore, the short term model, which has been found to fit for grade 7, may also hold for grade 8, but the psychosocial variables must be measured coincident with the smoking variables. Unfortunately, this approach does not allow for the determination of causality and could be an artifact of attitude change due to smoking behavior. It also bodes ill for the long term effectiveness of intervention programs since this implies that attitudes regarding social consequences and normative expectations influenced in grade 7 wil only prevent smoking in grade 8 through prevention of smoking in grade 7. External factors influence these attiitudes between grades 7 and 8 such that changes on these attitudes brought about by an intervention in grade 7 may be altered by grade 8 and increases in smoking or smoking onset may result. It would be valuable to investigate those external factors which influence these attitudes to determine if interventions which can maintain changes can be developed.

Future research should also investigate whether a short term model incorporating normative expectations and social consequences represents an appropriate model to explain smoking behavior in eigth graders, as well.

References

Ajzen, I., & Fishbein, M. (1970). The prediction of behavior from attitudinal and normative variables. Journal of Experimental Social Psychology, 6, 466-487.

Baumen, K.E., & Dent, C.W. (1982). Influence of an objective measure on self reports of behavior. Journal of Applied Psychology, 67, 623-628.

Brown, K.S., Cherry, W.H., & Forbes, W.F. (1978). The smoking habits of Canadian school children. In Canadian Councial on Smoking and Health, Proceedings of conference on student smoking. Calgary, Alberta.

Chassin, L., Presson, C.C., Bensenberg, M., Corty, E., Olsharsky, R.W., & Sherman, S.J. (1981). Predicting adolescents' intentions to smoke cigarettes. Journal of Health and Social Behavior, 22, 445-455.

Flay, B.R., d'Avernas, J.R., Best, J.A., Kersell, M.W., & Ryan, K.B. (1983). Cigarette smoking: Why young people do it and ways of preventing it. In P. Mcgrath and P. Firestone (Eds.) Pediatric and Adolescent Behavioral Medicine (pp. 132-183). New York: Springer-Verlag.

Jessor, R., & Jessor, S.L. (1977). Problem behavior and psychosocial development: A longitudinal study of youth. New York: Academic Press.

Joreskog, K.G., & Sorbom, D. (1981) Lisrel User's Guide. Chicago: International Educational Services.

U.S. Public Health Service (1979). Smoking and health: A report of the

Surgeon General. Washington D.C. U.S. Department of Health, Education, and Welfare.

U.S. Public Health Service (1981). The health consequences of smoking: The changing cigarette. A report of the Surgeon General. Washington D.C.: U.S. Department of Health and Human Services.

TABLE 1

Psychosocial Factors Predicting Cigarette Smoking in Adolescents

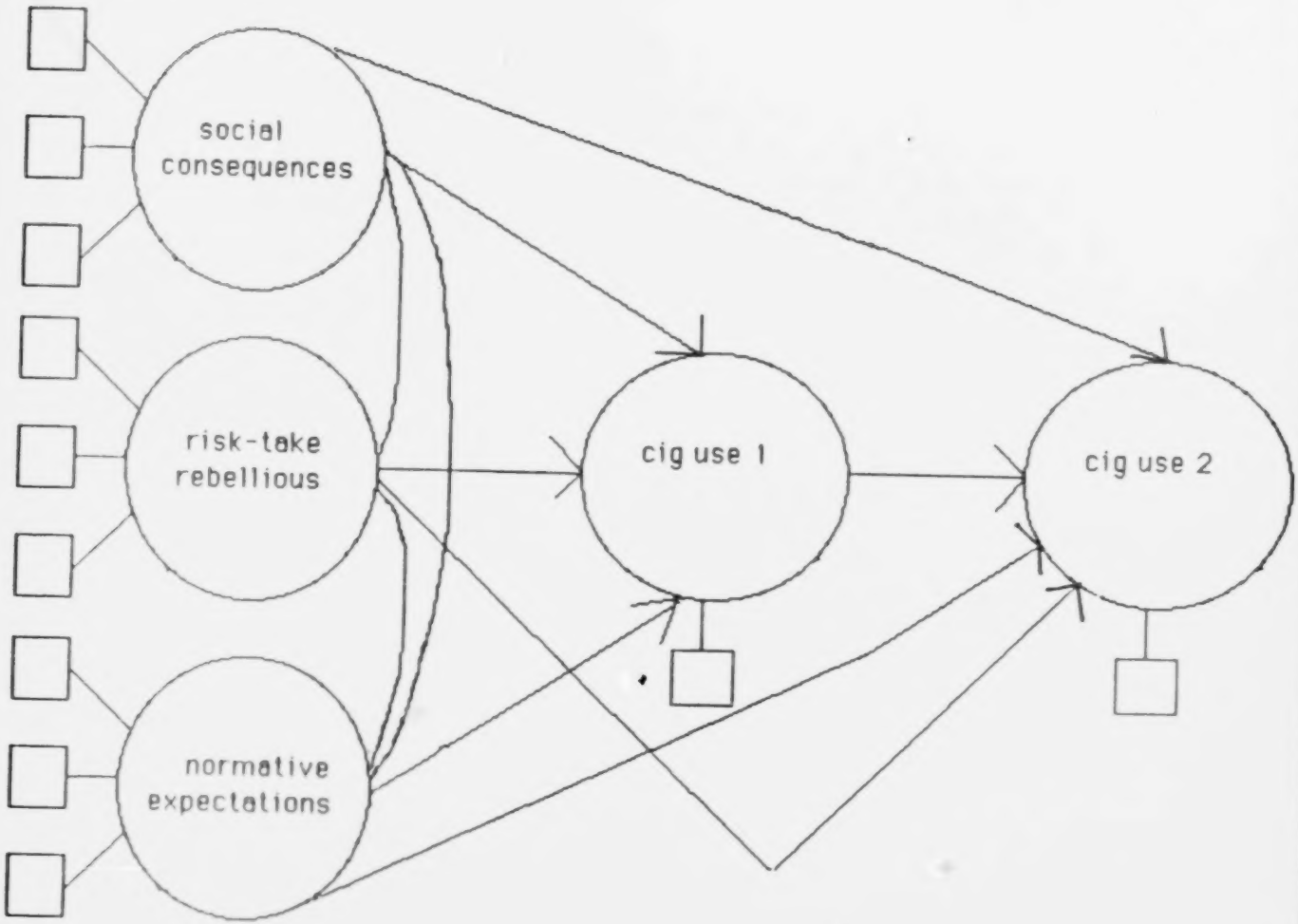


TABLE 2

Onset of Cigarette Smoking in 7th and 8th Graders

Q41 = If good friends offered a cigarette would you smoke it?
Q42 = If your best friend dared you to smoke, would you?
Q55 = If you smoked, would your parents approve?
Q59 = Do you like to do things that bother your teacher?
Q61 = Do your teachers pick on you?
Q62 = Do you like to take risks?
Q34 = Out of every 100 students your age, how many have tried cigarettes?
Q37 = How many of your good friends have smoked at least 1 puff?
Q38 = How many of your good friends smoke at least once a week?
Cig Use 1 = a composite of the following five items, standardized and summed:*

- Q16 = How many cigarettes in lifetime?
- Q17 = How long since last cigarette?
- Q18 = How much do you currently smoke?
- Q19 = How many cigarettes in last 7 days?
- Q21 = How long til you'll smoke again?

* On all, a low score indicates the low end of smoking behavior, a high score indicates a lot of smoking behavior.
Cig Use 2 = a composite of the same 5 questions, one year later.

TABLE 3

Correlations of Items with Smoking Indices

		SMOK1	SMOK2
SC1	(Q41)	.532**	.427**
SC2	(Q42)	.638**	.475**
SC3	(Q55)	.373**	.227**
RTR1	(Q59)	.172*	.248**
RTR2	(Q61)	.204*	.265**
RTR3	(Q62)	.154*	.191*
NE1	(Q34)	.237**	.303**
NE2	(Q37)	.419**	.369**
NE3	(Q38)	.533**	.391**

* = prob. $\leq$ .05 ** = prob. $\leq$ .001

SC = Social Consequences
RTR = Risk Taking/ Rebelliousness
NE = Normative Expectations

TABLE 4

Psychosocial Factors Predicting Cigarette Smoking in Adolescents

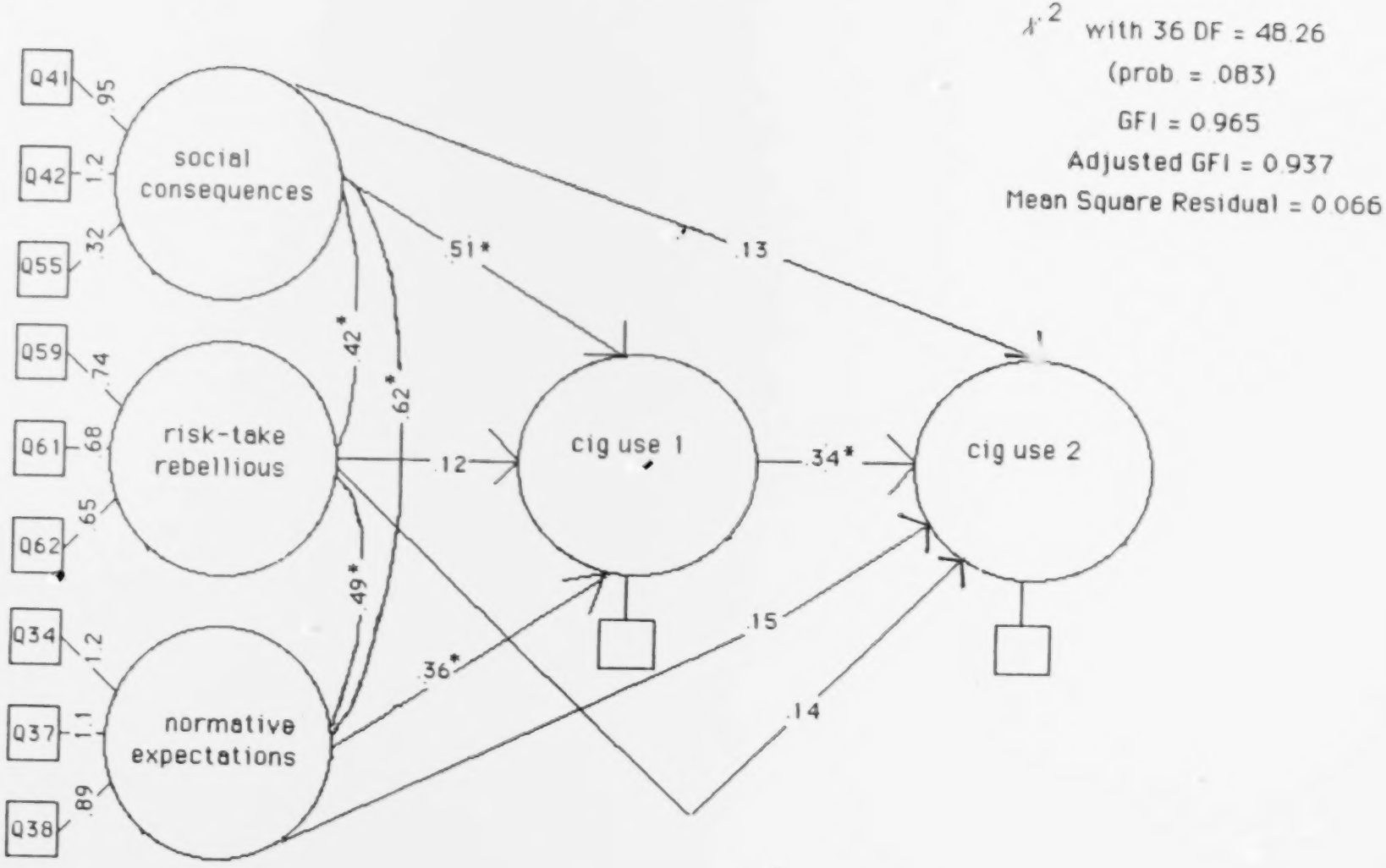


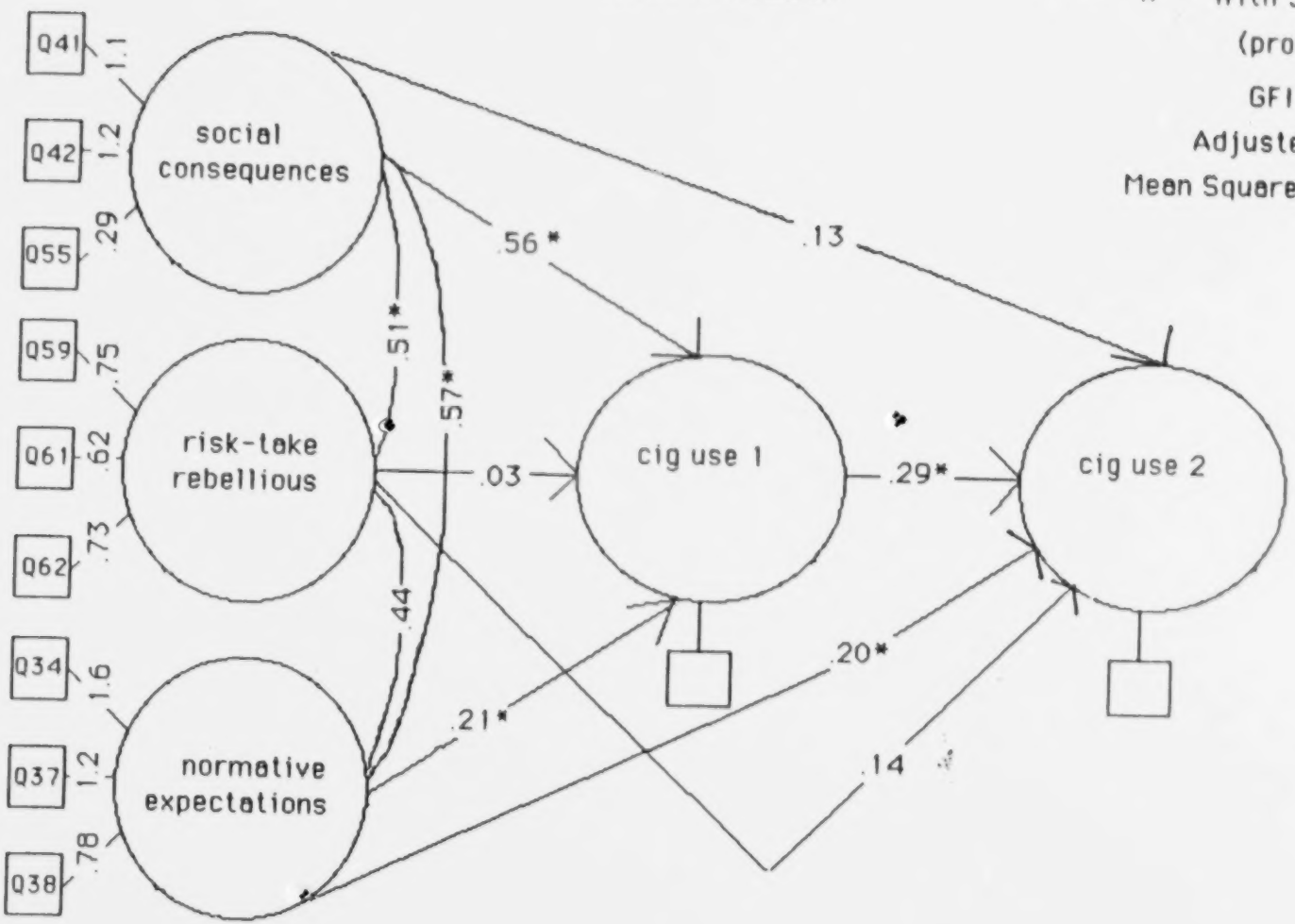
TABLE 5

	χ^2	DF	Prob.
Full Model	48.26	36	0.083
Submodel A	69.75	39	0.002
Diff (Full-A)	21.49	3	<0.001

TABLE 6

Psychosocial Factors Predicting Cigarette Smoking in Adolescents

Cross Validation



χ^2 with 36 DF = 57.89

(prob. = 0.012)

GFI = 0.962

Adjusted GFI = 0.930

Mean Square Residual = 0.058